tical feasibility that promises such great results.

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A PLAN FOR COOPERATION AMONG THE SMALLER BIOLOGICAL LABORATORIES

SECOND thought is hardly necessary for a realization of the fact that the scientific laboratories of the smaller colleges throughout the country suffer greatly from their isolation, from the overworked condition of the instructor, and from the indifferent quality of the materials for daily use in the ordinary courses in zoology, botany or general biology. Such conditions, furthermore, have a habit of continuing thus unchanged throughout the years, much to the vexation of the instructor as well as to the detriment of the many students, in the aggregate, who take the various courses.

Although the complexity and expense of thorough laboratory equipment are both unlimited, it is yet evident that the prime desiderata for the giving of the ordinary courses to undergraduates are fairly simple matters—a good culture showing large *Amœba proteus* in abundance, prepared slides stained so as to show mitosis plainly under a dry objective, and other similar items of equipment are matters simple to mention but far from being satisfactorily provided even in some of the better laboratories.

Some further conditions confronting the biologist in the smaller laboratory may be summarized as follows: The task of providing a set of slides satisfactory for illustrating the organology and histology of the earthworm is not so difficult a matter in itself but, when taken in connection with the preparation of many other needed series, it is obviously out of the question that the work be done thoroughly well. The result is either equipment good in quality but scanty in amount or, if the supply be adequate, the quality is low. At this point it is perhaps worthy of remark that the provision of class and demonstration materials for the use of elementary students requires a special talent of the preparator. The lack of special scientific insight characteristic of the average student makes necessary preparations as plain as to detail as they are lacking in special bias.

As a possible method for providing some of this equipment satisfactorily and from the scientist's, rather than from the dealer's, point of view it has many times occurred to us that a system of mutual aid among a league of the smaller laboratories might be established which would not only furnish a system of exchanges of material valuable for teaching and research purposes but which might also be conducive to scientific and educational benefits as well. The writer feels certain that many of the difficulties outlined above would be relieved by the method to be proposed, which, briefly stated, is as follows: For each of a number of laboratories to specialize upon the preparation of a different element of equipment as, for example, the culturing of protozoa or algæ, the collection and proper preservation of certain other available materials and, in particular, the preparation of histological or cytological slides high in value for the demonstration of general principles. A division of labor thus affected, special pains might be taken for the collection, fixation and staining of material of a definite sort in order that the very best results might be secured and in a field for which the special training of the biologist or the special development of his laboratory might reasonably be expected to add value to the product. The method once mastered the mechanical details of indefinitely repeating the process and so providing a supply for others at work upon other tasks might be carried on by almost any undergraduate assistant.

Concentration of effort upon a task of this sort might easily result in a surprisingly high quality of a certain preparation even from a laboratory of small size and very modest equipment, and conversely the returns from the establishment of the system in benefits from other institutions might safely be depended upon to steadily affect a marked improvement in the quality of the courses offered.

Geographical advantages might also be de-

pended upon to enhance the value of the factor of equipment undertaken by any certain laboratory.

A definite statement of the objects to be sought as well as regulation of the various activities would, of course, be necessary, as well as the establishment of a basis of values and rules governing exchanges of materials which might or might not be for monetary considerations. The establishment of such regulations could well be placed in the hands of a secretary or committee of the parties to the agreement.

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SCIENTIFIC BOOKS

A Revision of the Cestode Family Proteocephalidæ. By GEORGE ROGER LARUE. (Contributions from the Zoological Laboratory of Illinois, No. 33.)

The graduate school of the University of Illinois is to be congratulated on the publication of this monograph, which, we are informed, is a "Thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy."

Dr. LaRue has, in this thesis, made a contribution to the literature of helminthology of a kind that is much needed. He has performed the drudgery of examining the literature of his subject with skill and patience and at the same time has achieved noteworthy success in bringing order out of confusion. The labor of identifying species by future investigators should be much lightened on account of this contribution.

The monograph is a large volume of 350 pages and 16 plates containing 199 figures. The figures are simple line drawings, largely diagrammatic, but, so far as the writer has tested them, clear in diagnostic features and free from confusing or unnecessary details. Methods of technic are incorporated in the introduction, which should be of value to prospective workers on the anatomy of the cestodes. Hematoxylin mixtures are found to yield more satisfactory results than carmine. "It is noteworthy that the carmine stains give beautiful preparations of trematodes in toto, but fail almost entirely for cestodes. For the cestodes these stains fail because they do not sharply and clearly outline the sexual organs as they do in the trematodes, though not better than do the hematoxylins. In the judgment of the writer the use of carmine stains in cestode material has been responsible for many errors in the interpretation of cestode structures." An important introductory section deals with the anatomy and histology of the Proteocephalids. In this section the literature of this phase is reviewed critically. It is interesting to note that while insisting that the anatomy and finer structure of the internal organs furnish the most valuable characters for diagnostic purposes, the author remarks that more value should be given than is given to data as regards the host, the locality and habitat of the host, which data are always of value.

The insertion of a key to the better known genera and species of Proteocephalidæ is to be highly commended. The literature of the Cestoda is much scattered and there is need of synopses and keys if acquaintance with the distribution of species with all that goes along with that knowledge is to be extended and made accurate.

The bulk of the monograph is made up of the description of species of Proteocephalids, of which there are 33 from fishes and 18 from amphibians and reptiles. These descriptions are, from the nature of the case, of unequal proportions. For example, *Proteocephalus filicollis* (Rudolphi) and *P. torulosus* (Bartsch), neither found in this country, are given about eleven pages each. Extracts are made from French and German authorities and from the Latin of Rudolphi. There is perhaps justification in these instances for inserting descriptions in the languages in which they were originally written, although as a general practise the reviewer would advise against it. LaRue has not been content with simply reviewing the literature of such species as those just mentioned, but has studied material obtained from European helminthologists, and, having had the use of Dr. Ward's extensive collection, has been able to review the literature with an intelligence and authority that inspires confi-